CLAIMS

What is claimed is:

1. A method for fabricating a mask comprising:

forming a substrate including:

a first layer of attenuating material over said substrate;

a second layer of attenuating material over said first layer of attenuating material; and

an opaque layer over said second layer of attenuating material;

etching said substrate to form at least one completely transmissive region;

etching said substrate to form at least one slightly attenuated region, said etching including

forming a second patterned resist over said substrate; and

etching said substrate to form at least one highly attenuated region.

2. The method according to claim 1, wherein etching said substrate to form said at least one completely transmissive region comprises forming a first patterned resist over said opaque layer of said substrate and etching said substrate to form a plurality of isolated completely transmissive regions and a plurality of closely-spaced completely transmissive regions.

3. The method according to claim 2, wherein etching said substrate to form said at least one slightly attenuated region comprises removing portions of said opaque layer and said second layer of attenuating material to form a plurality of slightly attenuated regions, each of said plurality of slightly attenuated regions being positioned at an edge defining one of said plurality of isolated completely transmissive regions.

4. The method according to claim 3, wherein etching said substrate to form said plurality of slightly attenuated regions comprises forming a second patterned resist over said substrate.

5. The method according to claim 2, wherein etching said substrate to form said at least one highly attenuated region comprises removing portions of said opaque layer to form a plurality of highly attenuated regions, each of said plurality of highly attenuated regions being positioned at an edge defining one of said plurality of closely-spaced completely transmissive regions.

6. The method according to claim 5, wherein etching said substrate to form said plurality of highly attenuated regions comprises forming a third patterned resist over said substrate.

7. The method according to claim 1, wherein providing said substrate further comprises providing said substrate comprising an etch stop layer between said first layer of attenuating material and said second layer of attenuating material.

8. The method according to claim 7, wherein etching said substrate to form said at least one completely transmissive region comprises forming a first patterned resist over said opaque layer of said substrate and etching said substrate to form a plurality of isolated completely transmissive regions and a plurality of closely-spaced completely transmissive regions.

9. The method according to claim 8, wherein etching said substrate to form said at least one slightly attenuated region comprises removing portions of said opaque layer and said second layer of attenuating material in a single etch step to form a plurality of slightly attenuated regions, each of said plurality of slightly attenuated regions being positioned at an edge defining one of said plurality of isolated completely transmissive regions.

10. The method according to claim 9, wherein etching said substrate to form said at least one highly attenuated region comprises removing portions of said opaque layer to form a plurality of highly attenuated regions, each of said plurality of highly attenuated regions being positioned at an edge defining one of said plurality of closely-spaced completely transmissive regions.

11. The method according to claim 10, wherein etching said substrate to form said plurality of highly attenuated regions comprises forming a third patterned resist over said substrate.

12. A phase shift mask comprising:

a transparent substrate;

a plurality of isolated completely transmissive regions and a plurality of other regions;

a plurality of slightly attenuated regions, each of said plurality of slightly attenuated regions being formed at an edge defining one of said plurality of isolated completely transmissive regions;

a plurality of completely transmissive regions; and

a plurality of highly attenuated regions, each of said plurality of highly attenuated regions being formed at an edge defining one of said plurality of isolated completely transmissive regions, said plurality of highly attenuated regions comprising a first layer of attenuating material, a layer of etch stop material, and a second layer of attenuating material.

13. The attenuated phase shift mask of claim 12, further comprising a plurality of opaque regions.

14. The attenuated phase shift mask of claim 13, wherein said plurality of opaque regions comprise chromium.

15. The attenuated phase shift mask of claim 12, wherein said transparent substrate comprises a material selected from a group consisting of quartz, fused silica, and glass.

16. The attenuated phase shift mask of claim 12, wherein said plurality of slightly attenuated regions comprises a layer of attenuating material selected from a group consisting of chromium oxynitride and chromium fluoride.

17. The attenuated phase shift mask of claim 12, wherein said plurality of highly attenuated regions comprises a first layer of attenuating material and a second layer of attenuating material

18. The attenuated phase shift mask of claim 17, wherein said first layer of attenuating material is selected from a group consisting of chromium oxynitride and chromium fluoride and said second layer of attenuating material comprises molybdenum silicide oxynitride.

19. The attenuated phase shift mask of claim 12, wherein said plurality of slightly attenuated regions comprises a layer of attenuating material and a layer of etch stop material.

20. The attenuated phase shift mask of claim 19, wherein said layer of attenuating material is selected from a group consisting of chromium oxynitride and chromium fluoride and said layer of etch stop material comprises silicon dioxide.

21. The attenuated phase shift mask of claim 12, wherein said first layer of attenuating material is selected from a group consisting of chromium oxynitride and chromium fluoride, said layer of etch stop material comprises silicon dioxide, and said second layer of attenuating material comprises molybdenum silicide oxynitride.